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Compulsory Interchange of Services
Of Rival Telephone Companies

Electrical Engineering

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COMPULSORY INTERCHANGE OF SERVICES OF
RIVAL TELEPHONE COMPANIES

BY

WILLIAM CONRAD NEIN

THESIS FOR THE DEGREE OF BACHELOR OF SCIENCE

IN ELECTRICAL ENGINEERING

IN THE

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THIS IS TO CERTIFY THAT THE THESIS PREPARED UNDER MY SUPERVISION BY

WILLIAM CONRAD NEIN

ENTITLED COMPULSORY INTERCHANGE OF SERVICES OF RIVAL TELEPHONE

COMPANIES

IS APPROVED BY ME AS FULFILLING THIS PART OF THE REQUIREMENTS FOR THE

DEGREE OF Bachelor of Science in Electrical Engineering

Ellery Blaine

Instructor in Charge

APPROVED:

Morgan Brooks

HEAD OF DEPARTMENT OF Electrical Engineering



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The object of this thesis is to make a study of and give a discussion on the compulsory interchange of service of rival telephone Companies.

No one man is entitled to the credit of having first conceived or designed the telephone. It is the fruitage of years of experimentation and study. The United States Supreme Court, however, but no doubt unjustly, after a long fight awarded to Professor A. G. Bell a patent on his idea of the telephone on March 19th, 1878, and from that time until March 7th, 1893, when the original patent issued to Professor Bell expired, the Bell Telephone Company, or companies under the Bell control, were the only telephone companies in the telephone field in the United States, and had at that time about 300,000 subscribers or telephones in operation. After the expiration of the Bell patent there sprang up in nearly every town where the Bell Telephone Company was operating, and elsewhere, Independent telephone companies not only because of the exorbitant rates and practices of the Bell Telephone Company but also because the telephone field was open for good investments.

The competition of the Bell and Independent Companies has been so keen that today we have, not only a very extensive, but also a high class of service almost everywhere telephone service is rendered.

The next step in telephone progress, which we shall call it for the present, is the compulsory interchange of service of rival telephone companies in the same town. This problem has been dis-

cussed, somewhat, by the telephone public and the telephone companies in a large number of states in the Union. A definition of the subject is doubtless permissible: The interchange of service of rival telephone companies in the same town is the maintaining of the proper physical connections between the central offices or switch-boards of such companies, whereby a subscriber of one company can communicate with a subscriber of another company by means of his own telephone. The State of Texas has a law somewhat similar in character to a compulsory interchange of telephone service. A copy of the law and a discussion of the same will be given later. Bills requiring physical connections and an interchange of service of rival telephone companies in the same town have, this year and last, been brought before the state legislatures of many of the states of the Union. The following is a list of these states as far as the writers knowledge goes; Iowa, Nebraska, Minnesota, Tennessee, Missouri and Montana, which have at present or have had such bills before the Legislatures this year. To secure such legislation was tried in Arkansas several years ago but it failed. These bills, as a rule, require not only the compulsory interchange of service of rival telephone companies but also that State regulation shall fix the toll charged for such service.

I think that it is agreed by all that the present extent of service of the Independent as well as the Bell companies is, doubtless, as far reaching as could be expected, for the telephone movement is today probably not much more than in its infancy. Before

the Independent Companies took the field the telephone was used almost exclusively for business purposes. Today it can be found in a large percentage of the homes in almost every town; the farmer has it and he is fast becoming the back bone of the telephone field. The following table was recently given out by the United States Census Department. It gives the number of telephones for different classes of management in each state.

	TOTAL	INDEPENDENT (NON BELL)	BELL (AMERICAN T. AND T. CO.)	INDEPENDENT STATIONS CON- NECTED WITH THE BELL SYSTEM.
(1) United States	6,118,578	2,986,515	3,132,063	(2) 835,880
Alabama	40,481	14,985	25,496	3,944
Arizona	6,203	3,148	3,055	-----
Arkansas	49,576	32,150	17,426	10,265
California	237,672	65,977	171,695	9,607
Colorado	65,908	4,473	61,435	1,620
Connecticut	63,898	1,815	62,083	352
Florida	17,522	11,160	6,362	3,691
Georgia	62,260	26,204	36,056	9,072
Idaho	16,394	5,754	10,640	1,288
Illinois	558,585	285,322	273,263	109,101
Iowa	332,545	279,773	52,772	74,806
Kansas	200,233	161,913	38,320	66,880
Kentucky	93,996	51,796	44,200	9,038
Louisiana	35,692	6,184	29,508	4,351
Maine	53,134	16,024	37,110	7,830
Maryland, D.C. & Delaware	110,282	19,896	90,386	217
Massachusetts	209,383	5,324	204,059	650
Michigan	209,482	106,049	103,793	30,933
Minnesota	171,479	114,618	56,861	46,547
Mississippi	37,628	13,567	24,060	5,235
Missouri	312,527	220,823	91,704	82,393
Montana	17,168	8,118	9,050	846
Nebraska	153,279	105,610	47,669	45,252
Nevada	4,601	2,081	2,520	734
New Hampshire	28,920	6,488	22,432	2,482
New Jersey	116,988	19,134	97,854	831
New Mexico	6,653	3,476	3,177	759
New York	685,512	180,759	504,753	23,992
North Carolina	37,104	20,597	16,507	4,714
North Dakota	34,087	26,635	7,452	10,542

Ohio	495,636	312,278	183,358	29,284
Oklahoma	68,125	38,009	30,116	36,570
Oregon	49,629	16,223	33,406	10,675
Pennsylvania	450,403	174,582	275,821	11,976
South Carolina	20,911	7,872	13,039	1,867
South Dakota	48,405	44,751	3,654	25,933
Tennessee	71,130	25,758	45,372	9,241
Texas	187,862	108,832	79,030	30,334
Utah	30,630	10,528	20,102	451
Vermont	30,833	13,917	16,916	7,020
Virginia	55,541	24,118	31,423	4,447
Washington	98,846	35,652	63,194	9,168
West Virginia	62,144	46,609	15,535	3,238
Wisconsin	158,875	89,005	69,870	36,366
Wyoming & R.I.	30,605	1,538	29,067	1,267

- (1) Telephony March 13, 1909.
- (2) Figures furnished by the American Telephone and Telegraph Company included in total for Independent.

This report permits of some interesting comparisons with the Census of 1902, which is not given but can be secured from the United States Census Department Washington, D.C., and between the Independent and the Bell branches of the industry. The number of telephones is, probably, the best indication of the magnitude and extent of the industry, and the report shows that there were 6,118,578 telephones in Continental United States at the close of the year 1907 compared with 2,371,044 at the close of the year 1902, an increase for the five years of 3,747,534 telephones or 158.1 per cent. The Independent (Non Bell) systems contributed 1,932,649 telephones of the total increase, or 183.4 per cent, as compared with an increase of 1,814,885 telephones or 137.8 per cent for the Bell System. The service as rendered by the telephone companies today is not only extensive but also of a good quality, because

almost everywhere there are competing companies and competition naturally makes the service good and extensive as is shown by the figures above and as will be shown by argument later.

But the advocates of compulsory interchange of service of rival telephone companies maintain (1) That a greater extent of service would result. (2) That it would increase the number of subscribers of all the companies. (3) That a toll for the interchange of service should be paid by the different companies. (4) That State Regulation should fix the toll rates and that it should be in proportion to the number of subscribers of the different companies.

Opponents of the question maintain: (1) That the present service of the telephone companies is as good and extensive as they can afford to give. (2) That it would kill competition and inferior service would result. (3) That it would cause the different companies to combine. (4) That a state could not produce the desired effect.

This conflict of opinion brings before us the main issues of our discussion: (1) Are the present methods of the different telephone companies satisfactory from the point of view of the public? (2) Would an interchange of service improve present conditions? (3) Can a state law make the project a success?

Are the present methods of the telephone companies satisfactory from the point of view of the public? They are because the companies give an extensive and good quality of service at reason-

able rates. The report of the United States Census Department given above, and the comparison shown between the census of 1902 and 1907 show the extent of the different telephone companies in the different states and the progress which has been made between the year 1902 and 1907 inclusive. Is not an increase of 158.1 per cent of the total number of telephones in service in the United States in the five years mentioned, a rapid extent of service? And that this extent of service is increasing is shown by the vast number of telephone companies that are being incorporated in every state, particularly in the western and southwestern ones where the service as can be seen from the report given above is not as extensive as in the eastern states. Take the state of Illinois for example. Every town of any size at all has both the Independent and Bell service and with extensive country lines connected with their city service; also almost every small town or railroad station in the state has a telephone exchange connecting some of the neighboring smaller towns and villages and with toll lines to the larger towns. This service as a rule is Independent service, although the Bell Company has toll lines in nearly all these small towns, and is greatly extended among the farmers, in fact they make up by far the largest percentage of the subscribers of these small companies. The towns of Champaign and Urbana with a total population of about 16,000, have two companies; the Independent Automatic which has practically 1800 subscribers ~~excluding~~ country lines with

about 200 subscribers; and the Central Union Telephone Company which has about 1900 subscribers. ~~This shows that there are about 1900 subscribers.~~ This shows that there are about 4.23 persons for each telephone in the towns which is a high percentage of telephones per person. Some towns and cities have a higher percentage and some a lower but it is a fair example. The following table gives some interesting averages from the Census Report. These averages were worked out by the Electrical World.

	1907	1902
Average miles of wire per system and lines	565.9	536.4
Average miles of wire per system (exclusive of rural lines)	2,375.	1,168.5
Average miles of wire per station, total	2.1	2.1
Bell	2.9	2.6
Independent	1.4	1.4
Number of exchanges per system (exclusive of rural lines)	2.9	2.5
Messages or talks per station per year	1859	2139
Messages or talks per station per day (325 days)	5.7	6.6
Long Distance and toll messages, per cent of total	2.2	2.4
Income per station	\$ 30.15	\$ 36.62
Expenses per station	\$ 23.01	\$ 27.48
Per cent of expences to income	76.3	75
Average cost of construction and equipment per mile of wire	\$63.05	\$ 79.44
Average cost of construction and equipment per station	\$134.00	\$164.22
Out standing stocks and bonds per station	\$134.14	\$146.48
Average rate of dividends on stocks outstanding	4.6	5.5
Average rate of interest on bonds outstanding	4.1	4.7
Average yearly salaries of salaried employees	\$763.00	\$700.00
Average yearly wages of wage earners	\$412.00	\$408.00
Average miles of wire per farmer or rural line	27.5	10.
Average miles of wire per farmer or rural stations	.86	.90

Commenting on these figures the Electrical World says:

Naturally, some of the averages are to be accepted with caution, but it is noted that the income per station is much less than five years ago, that the extent of service is far greater, cost of

plant is less and average capitalization is less.

The service which the telephone companies give is not only extensive, as has been shown above, but also of a high quality. This can be seen by a comparison of the quality of service rendered by the Bell Company before the Independents were in the field, and the quality of service rendered today. In the first place, up to 1893, when the Bell patents expired, the Bell Company had only 300,000 telephones operating in the United States. The service as a rule was poor and the rates were unscrupulously high. I consider it needless to give statistics to prove the truth of the foregoing statement; just ask any one who was a telephone subscriber at that time. At that time a new subscriber ordering a telephone would get it maybe in a week or maybe in three months; if it worked alright he was lucky, if it didn't he could wait until the company got good and ready to fix it. There was no competition, hence no necessity or desire to render efficient service, but a desire to collect the unscrupulous charges as soon as they were due was not lacking. How different the situation is today with competitive companies in the field. Each company is constantly doing all it can to give the better service, such as keeping all the lines in the best of condition, keeping the instruments in their proper working order and having in their employ operators who do their duty. Almost any telephone user will admit that it is not a very hard matter to get annoyed at his telephone if it humms and buzzes, or if the operator is slow and lazy about giving connections, or

if she is ill tempered when you call the second time if the proper connections were not given, or the party did not answer. All these things are required to make up a good quality of service, of course the reverse of the last statement is implied, and they do exist with most companies if not with all of them. As far as time and secrecy goes in quality of service, the Automatic is doubtless the 'phone which will save time and trouble. If you call a party and get the busy signal you know at once that the line is busy, if the line were not busy you get your party almost as quick as you can get Central; when you have finished your conversation you can call another party in the time it takes to pull down the switch hook and work another number.

The rates charged for the service today are in a majority of cases less than half those charged by the Bell Company when operating as a monopoly and in some cases many times less, almost any one knows this to be a fact so it is needless to give definite proof of it; the rates charged, of course, vary with the different cities and towns, in a city with about 3000 subscribers the charges are generally \$18.00 per year including the country service. This is a reasonable charge and no doubt the reasonable rates of the companies have had a decided influence on extent of the telephone service. Thus today we have an extensive and a high quality of service at a reasonable cost.

On the other hand the affirmative contend that the present methods of the telephone companies are objectional from the point

of view of the public because: The service which the different companies render is not as extensive as they can afford to give for the rates that are charged. How many telephone companies are there in the state that will give out to the public the exact percentage of their earnings? In answer to this question I can say, without hesitation, that few if any will do so. The companies are, doubtless, making a large percentage on the capital they have invested and could afford to give an interchange of service for reasons which will be shown later on, and still make a fair percentage on their investment. The depreciation of the apparatus of the telephone companies, excepting the over-head lines, and as these are being put underground as fast as possible their depreciation will also be reduced to a minimum before long, is far less than that of other companies' who have as much capital invested and who are, doubtless, getting a far less percentage on their investment, but are, nevertheless, making reasonable profits.

There may be some question as to the truth of the foregoing statement but I think it will hold true on the ground that telephone apparatus has reached a high state of perfection and that renewals of apparatus, which has been the greatest depreciation in the past, will be only necessary when the apparatus is entirely worn out, and not due to some decided improvement of the apparatus.

It is true that each company tries to get as many subscribers as it possibly can, and thereby increase the extent of it's service, but an interchange of service is the system which would increase

the extent of the service to what the public wants. Such a system would be most keenly appreciated in case of an emergency where the party wanted had one telephone and the nearest phone was the other phone; in such a case a saving of life or property might be brought about where otherwise it would be lost. Numerous such incidents could be cited where an interchange of service would save time, money and trouble.

Would an interchange of service improve present conditions?

It would not, for it would tend to, if not entirely, kill competition. The different companies would under such a system be operating as, what amounts to no more than, one company. As a matter of fact, the telephone men who have been called upon to express their views of such a service have been unanimous in agreement, that it would retard development, destroy the benefits of competition and be tantamount to confiscation of property.

One of the arguments advanced for this physical connection is that the railroads are compelled to connect. They are on an entirely different basis. In the railroad business the motive power of the company receiving the car takes charge in connection with its own means of hauling all its load, whereas in the telephone business all connection would be made and the instruments would be those of the opposing company, and the lines used would be those of the opposing company. The service would be just what the company receiving the message would desire to give. In other words, if the Independent Company were to use the toll line of the Bell

Company they would hear that the lines were busy or in trouble, and it would be impossible for the Independent Company to do business over these lines, and vice versa.

The chain is no stronger than its weakest link, so that this compulsory connection, it seems to me is weak in two particulars; First, There could be no arrangement between the operating companies of such a character as to be mutually satisfactory to each company, and good service would require that all operating rules should be alike and that there should be some central authority responsible for defects in operation, and this requires the apparatus to be of such a type as to give the best service. It is unnatural to expect that any company would give its best service to its competitor and injure its good name. Even now companies get credit for poor sense for connecting with small companies. It would result in poor service; one company would seek to injure the other by saying that trouble was occasioned by their defective apparatus. Second: It would retard the development of the telephone business. No Independent operator or Bell either, for that matter, would put money into a town in the building up of a telephone business in which there was already an operating company if it thought compulsory connection would obtain, and that its competitor would have the advantage of it's expensive development, for it would amount to practically, no more than confiscation of it's property; small companies springing up.

To enforce a measure requiring an interchange of service, seems

to me, would be the cause of the different companies combining into one company, as they would be compelled to operate as one company it would be no more than natural that they would combine. They could operate more cheaply in all departments and would thereby save the amount they constantly spent in trying to out do each other; this is no more than economical and would doubtless result. Before long we would be back to our old Bell monopoly with inefficient service and high rates. But the public needs competition, it wants competition and its interest in competition is unquestioned. The public is prepared, with Macaulay, to take it for granted that the effect of monopoly generally is to make articles scarce, to make them high priced and to make them bad. The public has had this experience with telephone monopoly and has been willing to try competition in order to obtain a fair supply of good service at reasonable rates. Against such competition has been urged that it divides the users and increases the necessary investment - and little else. It is said telephone competition means half service or double cost. Historically it has meant multiplied service and diminished cost. In the absence of competition, real or threatened - the Contemplating user found the public divided between the few on one system and the great mass on none. In its presence he can find many many on one, many on the other, and almost the sum of these two manies on the two. If he is satisfied with either division, his cost is certain to be very much less than formally for a smaller number of maximum connections. If he wishes to reach the largest

number, then his payments to both systems will be far short of double - perhaps no more than the single now - competitive payment. The combination at its necessarily higher price would yield him no connection with those that would decline to pay such a price. The public has gained through competitive telephone service the making of the service less scarce, less dear, and less poor. It has reason to expect through continuance of competition that it will be made still more extensive, still more available, relatively less expensive, and even better in quality. It is certain that the public would look with disfavor upon telephone consolidation. For everyone it might benefit there are dozens whom it would disaffect.

The following table shows the cost of telephone service before and after competition in nineteen cities throughout the United States, from Portland, Maine, to Los Angeles, California. In every instance the statistics prove the truth of the contention that competition not only has reduced rates, but has brought about better service and increased the number of subscribers.

UNDER MONOPOLY FIGURES TAKEN JUST BEFORE COMPETITION BUSINESS RATE, PRIVATE LINE			UNDER COMPETITION JANUARY, 1907 BUSINESS RATE, PRIVATE LINE			
BELL CO. RATE CITIES	NO. BELL CO. 'PHONES	BELL CO. RATE NOW	INDP'T. BOTH CO. 'PHONES UNLIMI'D COST		TOTAL 'PHONES	
Albany	\$ 96.00 3,500	\$48.00(1200 calls)	\$48.00	\$96.00	11,300	
Cleveland	125.00 4,200	54.00(1200 calls)	72.00	126.00	50,162	
Columbus	84.00 1,800	54.00 UNLIMITED	40.00	94.00	19,246	
Dayton	72.00 2,000	54.00 "	40.00	94.00	13,300	
Fall River	120.00 900	66.00 "	36.00	102.00	4,700	

Grand Rapids	115.00	1,471	30.00	UNLIMITED	36.00	66.00	11,673
Indianapolis	74.00	2,300	54.00	"	40.00	94.00	19,973
Kansas City	96.00	9,800	48.00	(960 Calls)	54.00	102.00	36,500
Lincoln, Nebr.	84.00	2,000	48.00	UNLIMITED	36.00	84.00	7,541
Los Angeles	96.00	10000	UNCERTAIN		48.00	-----	4,879
Louisville	96.00	3,200	42.00	UNLIMITED	48.00	90.00	17,050
Minneapolis & St. Paul	120.00	4,800	60.00	(1200 Calls)	48.00	108.00	42,949
New Bedford	120.00	815	66.00	UNLIMITED	36.00	102.00	4,600
Portland, Me.	84.00	2,500	42.00	(840 Calls)	42.00	84.00	17,800
Rochester	94.00	1,700	48.00	(1200 Calls)	48.00	96.00	11,850
Syracuse	96.00	1,600	60.00	UNLIMITED	48.00	108.00	15,000
Toledo	72.00	2,500	54.00	"	48.00	102.00	15,000
Trenton	100.00	2,000	60.00	"	36.00	96.00	9,000
Wilmington	97.50	750	72.00	"	36.00	108.00	11,000

Competition is the life of trade and the above statistics prove it.

(1) Telephony April 1907.

For further figures see Telephony April 3, 1909, page 414.

The cost to which the telephone companies would be subjected, to provide the interchange of service, should also be considered; it would come under two divisions: First; The cost of trunk lines connecting the different companies and the extra switch board equipment. In a small town with only two companies, the cost of sufficient trunk lines, to accommodate all calls between the two companies, and an extra section of switch board to accommodate these trunk lines would probably not be an overburdensome amount, but would, no doubt, be sufficient to make the companies feel as though they were imposed upon without considering all other objec-

tions. But in a large city, like Chicago, where a number of competing telephone companies are operating, the cost of the necessary number of trunk lines interconnecting all the different companies, and the necessary switchboards for the accommodation of these lines would mean an enormous expenditure on the part of each company; a thing which is no doubt unjust to the companies.

Second: The continual cost for the extra operators required. The number of extra operators, required by each company, would, of course, vary with the number of companies and subscribers of each, and with those who had two or more telephones. The two telephone proposition would, of course, dwindle down to one phone. Also judging from the probable number of calls made between the different companies, the operating force would doubtless be almost doubled and in some cases more than doubled.

Any fair minded person who has any knowledge, whatever, of the cost of telephone equipment, installation of the same and a doubling up on the operating force would concede that it would be an overburdensome cost on all the companies, a cost which they could not get back in any way except, which they would no doubt do, by combining, cutting down the quality of service and raising the rates.

It is said that the charges for the interchange of service and the additional number of subscribers which each company would get would pay for the additional investment and increase in operating expenses. Whether they would or not is a question, but it seems

to me that they would not for: In a large majority of the towns both companies, or in places where there are more than two companies, the number of subscribers of the different companies is approximately the same, and about the same amount of business is done over one telephone system as over the other, so that at the end of the month or year or when ever a settlement is made between the companies there will be little due either company.

In case one company does have to pay the other a sum of money it will be all the worse off for it, of course, the company getting the money would not. That the increase in the number of subscribers that would be secured, the rates being kept the same as they are at present which has been assumed at all times, would also pay for the additional cost of such a system; but a large percentage of the people have both telephones and nearly all business houses have both. They would, of course, discontinue one of them, if such a system were adopted, and it is doubtful whether or not the increase in the number of new subscribers would over balance the number that discontinued, not alone pay for an operating expense that would be almost, if not in some cases more than doubled, and also for the enormous first cost of apparatus and installation. Therefore, it stands to reason that the net earnings of the companies would be almost, if not, entirely cut in two, a thing which the companies could not stand, for competition has been so keen that their earning have been cut down almost to a minimum, and as I have stated before there would doubtless result a combination of

all the companies with the accompanying evils which have already been pointed out.

On the other hand, the affirmative contend that it would improve present conditions because: The public would get a greater extent of service, in fact, in most cases a double extent, or in a large city which has a number of companies, several times the amount or extent of service that it is able to get today for the price of only one telephone.

The following is a law enacted by the Legislature of the State of Texas, which is related to the subject somewhat.

TELEPHONE AND TELEGRAPH COMPANIES- REQUIRING CONNECTIONS AND TRANSFER OF MESSAGES.

S.B. No. 24. Chapter XII.

An Act to compel telephone and telegraph companies to arrange for connections or transfer of messages with other telephone and telegraph lines doing a like business, and declaring an emergency.

BE IT ENACTED BY THE LEGISLATURE OF THE STATE OF TEXAS:

Section 1. That all companies and corporations that own or operate telephone or telegraph lines for the purpose of transmitting messages from one point to another are hereby required to arrange for conversations or transfer of messages as hereinafter provided.

Section 2. All companies, individuals, firms or corporations doing a telephone business in this State shall be compelled to make physical connections between their toll line at common points for the transmission of messages or conversations from one line to another. Such connection to be made through the switchboard of such individuals, companies, firms or corporations, if any is maintained at such points, so that persons so desiring may converse from points on one of such lines to point on another.

Section 3. All telegraph companies or persons, firms, corporations or associations of persons, which are now or shall hereafter be engaged in the business of accepting and transmitting messages to and from different points in this State, where the use of a telegraph instrument or instruments is necessary in the conduct of such business, shall, if there be any other persons, firm, cor-

poration or association engaged in such business at the same point or in the same town, city or village, provide means whereby all messages conveyed to such points over the lines of any such companies shall be transferred to the lines of either or all other such companies engaged in such business at such common points and transmitted to their final destination, and such facilities shall be provided as will guarantee the transfer of such messages in compliance with the provisions of this act; provided, that in no case shall any message be transferred from one line to another against the will of the company first handling same when it is possible for such company to deliver said message direct to the party for whom it is intended via the line or lines operated and owned by said company, and provided further, that no telegraph or telephone company shall, under the provisions of this act, be compelled to receive from the wires or lines of any other telegraph or telephone company and convey to its final destination any message originating at any point on its own lines.

Section 4. The city council in incorporated cities and the commissioners court at points where there is no city council, shall, on the application of one hundred resident citizens, or upon its own motion, hear such evidence as they think necessary, and upon a final hearing they shall determine whether or not it would be necessary for public convenience and just to the telephone or telegraph companies to make such connection or arrange for transfer of messages, whereupon they shall enter of record their findings, and shall also set out in their order the conditions upon which such arrangements for conversation or transfer of messages shall be made, and shall decide what proportion of expense shall be paid by each of said connecting lines.

Section 5. Whenever the city council or commissioners court shall enter an order in compliance with Section 3 of this act, requiring telephone or telegraph companies to arrange for conversation or transfer of messages, it shall be compulsory on said company to arrange for such conversation or transfer of messages, and failing to do so shall forfeit to the State of Texas, on suit by the county or district attorney, the sum of ten dollars for each and every day they so neglect; provided, that the penalty herein assessed shall not be operative against a company which is prevented from making connections as herein required through the fault or omission of another company, so long as such fault or omission shall cause such failure on its part to so connect; provided further, that any company ordered to arrange for conversations or to transfer messages between its line and another line as herein provided shall have the right to appeal from such order to the court having jurisdiction over said matter, and the court shall, if it shall find that appellant had reasonable grounds for prosecuting such appeal, suspend the penalty herein provided for until such appeal is finally determined.

Section 6. The fact that there is no law requiring telephone and telegraph companies to connect in this State, creates an emer-

gency and an imperative public necessity, requiring tha the constitutional rule which provides that all bills shall be read on three several days be suspended, and said rule is hereby suspended and that this act take effect from and after its passage, and it is so enacted.

Approved May 16, 1907.

Takes effect ninety days after adjournment.

This bill, as can be seen, provides that telephone and telegraph companies shall be compelled to make physical connection between their toll lines at common points for the transmission of messages or conversations, from one line to another. Such connections to be made between the switch-boards of such companies, if any is maintained at such points, and provides "That no telephone or telegraph company, under the provisions of this act, be compelled to receive from the wires or lines of any other company and carry it to its final destination any message originating at any point on its own lines". The bill also provides that this shall be done by order of the city council, in incorporated towns, and in the Commissioner's Court at points where there is no city council. After an application has been made, it it shall determine upon final hearing that it would be for public convenience and justice to the telephone or telegraph companies to make such connection, where upon they shall enter of record their findings and shall also set out in their order the conditions upon which such arrangements of conversation shall be made. I take it, under the provisions of this bill, that a connection can be forced by one company upon another from a non-competitive point, but the attitude of the

Bell telephone system towards the Independent system in Texas and vice versa renders it very improbable that either company will ever make application for this connection.

The following are copies of bills brought before the state Legislatures of Nebraska and Iowa.

LEGISLATURE OF NEBRASKA
Thirty-First Session.
HOUSE ROLL NO.340

A BILL,

For an Act to provide for the connection and intersection of telephone lines, repealing conflicting statutes.

Introduced by Evans of Hamilton County.

Read first time Feb. 9, 1909.

Read second time Feb. 10, 1909, and referred to the Committee on Telegraph, Telephone, Etc.

Sent to printer Feb. 10, 1909.

BE IT ENACTED BY THE LEGISLATURE OF THE STATE OF NEBRASKA:

Section 1. That every telephone company shall have the right with its line, to intersect, connect with or cross any other telephone line, and it is hereby made the duty of all telephone companies, doing business within the State, to connect their lines at convenient intersecting points and to render, furnish and perform joint service under such regulations as shall be prescribed by the State Railway Commission, whenever it shall be made to appear, as hereinafter provided, that such connection is for the public good. And it is hereby made unlawful for any telephone company or companies within this state to refuse to connect their lines, as aforesaid, with the lines of other telephone companies at convenient intersecting points and to refuse to render, furnish and perform joint service;

SECTION 2. That the State Railway Commission, on its own initiative, or on the complaint of any person interested, may order a hearing of any matter arising under Section One of this Act;

Section 3. That the State Railway Commission are hereby empowered to make such reasonable general rules concerning notice, pleading, procedure and practice in cases brought before such commission under Sections One and Two of this Act as may be proper in the premises;

SECTION 4. That, if, in any case so brought, it shall appear upon hearing that the public good requires the connection and service of the telephone lines so sought to be connected, the State Railway Commission are hereby empowered to order such companies to make the connection required, to fix reasonable rates therefor and to require

such companies to render, furnish and perform joint service under such connection;

Section 5. That any order so made, under Section Three of this Act may be enforced by mandamus before any court of competent jurisdiction;

Section 6. That the constitutional right of appeal shall not be denied or abridged in cases coming under this Act. But the rules governing other cases of appeal from decisions of the State Railway Commission shall govern under the provisions of this act;

Section 7. That all acts and parts of acts inconsistent with this act are hereby repealed.

A BILL

FOR AN ACT COMPELLING TELEPHONE CENTRAL OFFICES OPERATING IN THE SAME CITY, TOWN OR VILLAGE, TO MAKE AND MAINTAIN A PHYSICAL CONNECTION AND REGULATE TOLL THEREFOR, AND PUBLISH TELEPHONE DIRECTORIES FOR DISTRIBUTION TO THE PUBLIC, AND PROVIDING PENALTY FOR FAILURE TO COMPLY.

Be it Enacted by the General Assembly of the State of Iowa:

Section 1. That in any village, incorporated town, or city of the State of Iowa, wherein two or more central telephone offices or stations may be maintained in connection with different systems of telephones, the persons, partnerships, or corporations owning or operating said systems shall construct and maintain proper wire connection between said central offices or stations for the transmission of messages between the same.

Section 2. The toll charge by each of said companies furnishing service by means of the connection provided in section 1 hereof, shall in no case exceed the toll charged for such service rendered without the use of said connecting line.

Section 3. Every person, partnership, or corporation publishing a telephone directory in connection with the operation of a telephone system shall provide a reasonable number of such directories for sale to any and all purchasers at the reasonable cost thereof, not exceeding fifteen cents for each hundred names contained therein.

Section 4. Any person, partnership, or corporation not complying with the requirements of this act on or before January 1, 1910, shall be deemed guilty of a misdemeanor and, upon the conviction thereof, shall be fined not to exceed the sum of twenty-five dollars, and each day of failure so to comply shall constitute a separate offense.

As can be seen, both Bills require that reasonable rates be charged for the interchange of service. I do not think the above bills provide for exactly what the public wants because of the charge for the interchange of service. This would leave the situation practically as it exists today, for: A business house has, generally, as much business to transact over on telephone system as over the other; this is also true of private use in a majority of cases and at the end of each month when the charges for the interchange of service were added up they would, no doubt, be as much and very likely to be more than the additional cost of an extra telephone.

What I think the public wants is, a free interchange of service with the subscription price remaining what it is at present, and one which provides that the different companies pay the toll for the service they render each other, also that State regulation should fix reasonable rates and in proportion to the number of subscribers of the different companies. For example, if the Independent company had 3000 subscribers in a certain town and the Bell company had 1500, the rate which the Bell company should pay the Independent company should be twice what the Independent company should pay them; assuming that the telephones are in the ratio of 2 to 1 in both business and residence districts. This would be no more than just for the number of calls the Independent company would get through the Bell Company would no doubt be double the number the other way. Such a system, it seems to me, would give the subscribers of both companies exactly what they want. A careful study

of the situation with regard to the fixed amount of toll per call would have to be made in every town to prevent any injustice to either company.

Such a system, I think, would increase the number of subscribers of all the companies because: There are a large number of people in a town or city who friends that have telephones are equally, or nearly so, divided among both companies and who feel as though they cannot afford two telephones, and rather than have one they do without either. These people would, doubtless, have a telephone if such a system was adopted. I think that such a system as described above, would be such a big inducement to the public that people who had never even thought of having a telephone would be added to the subscription list of either company. This I think would compensate for the free interchange of service.

That competition would be diminished somewhat will have to be admitted but I think that it would not be entirely eliminated because the company having the larger number of subscribers would not only have the larger net profits from the subscribers but would also get the benefits of the difference in sum of the rates for the interchange of service, and, I think, there would be a continual striving on the part of each company for more subscribers. Such a system would therefore not only greatly benefit the public but would also benefit the individual companies.

The physical connections required in case of magneto or central energy systems would be simply, a sufficient number of trunk

lines and sections of switchboards, similar to those already installed, to accommodate these trunk lines.

The connections for an Automatic switchboard and a central energy or magneto system switchboard is a somewhat different proposition, however, at first thought it would seem rather complicated but it is relatively simple after all. The accompanying diagrams show the scheme of the connections which are to be used for the connection of the University of Illinois Automatic private exchange and the Central Union Telephone Company central energy system of Champaign, Ill.

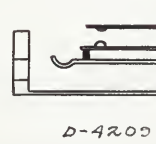
The specifications for the installation and description of the operation of the same follow the diagrams.

TO LISTENING & ALL INCOMING KEYS.

TO CALL DEV. KEYS & ALL OUTGOING TRAMMERS.



D-3892



D-3712.

D-4200



D-5906

HEAD RECEIVER

BLUE
BLACK M.

RED T.

BLACK M.

BROWN M.
BLACK M.
BLUE T.

IND COIL D-2874

D-6875

D-6875

BROWN T.

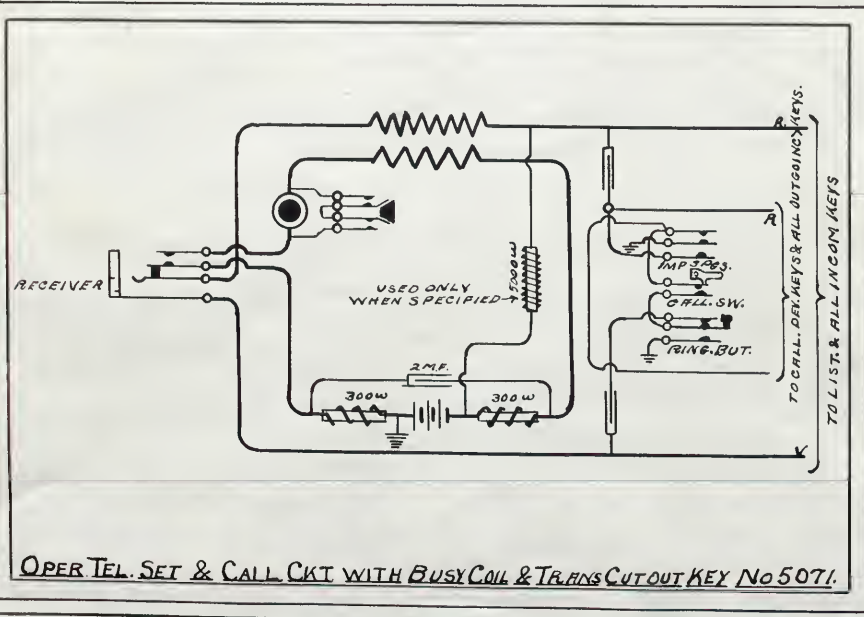
RING. BUTTON

IMPULSE SPRINGS.

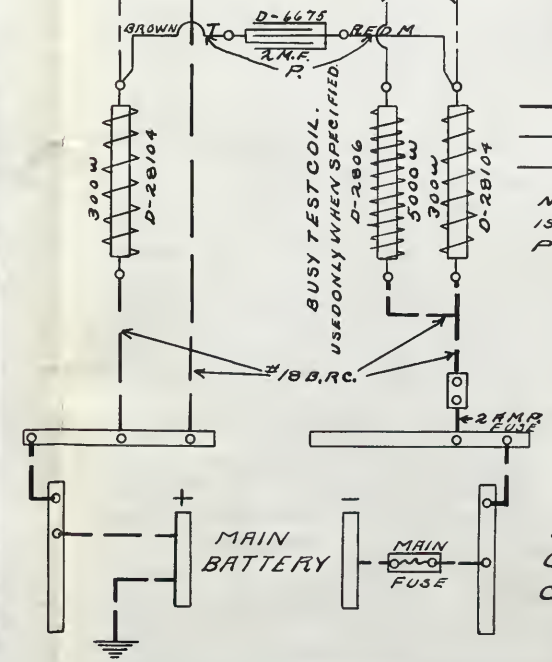
CALL SWITCH

CALLING DEVICE.

TRANS. BINDING POSTS



OPER TEL. SET & CALL CKT WITH BUSY COIL & TRANS CUTOUT KEY NO 5071.

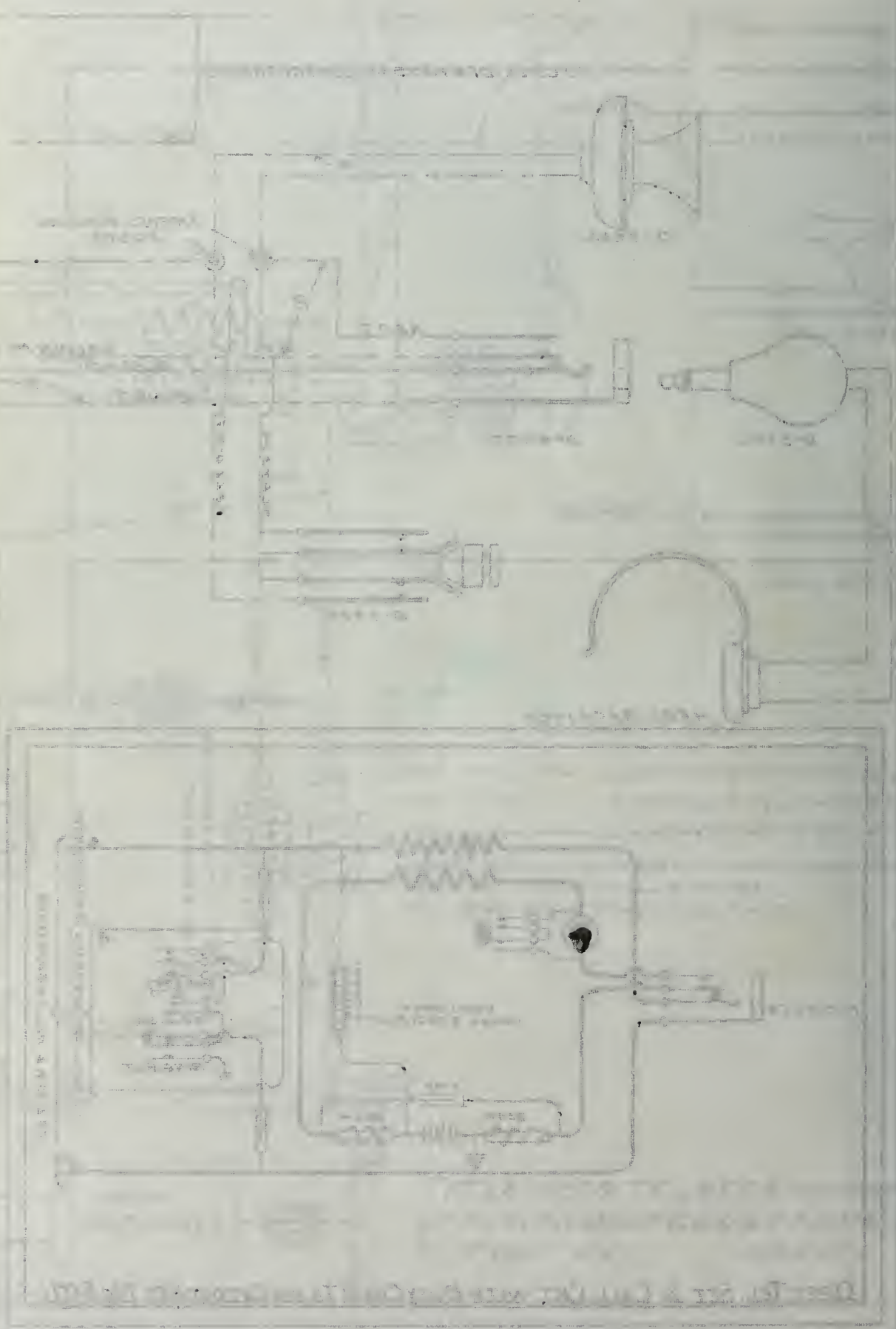


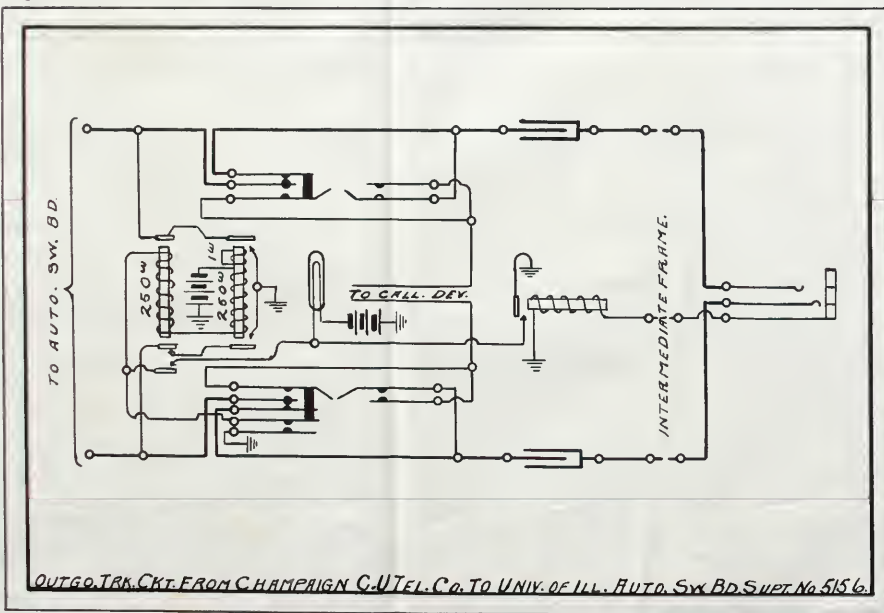
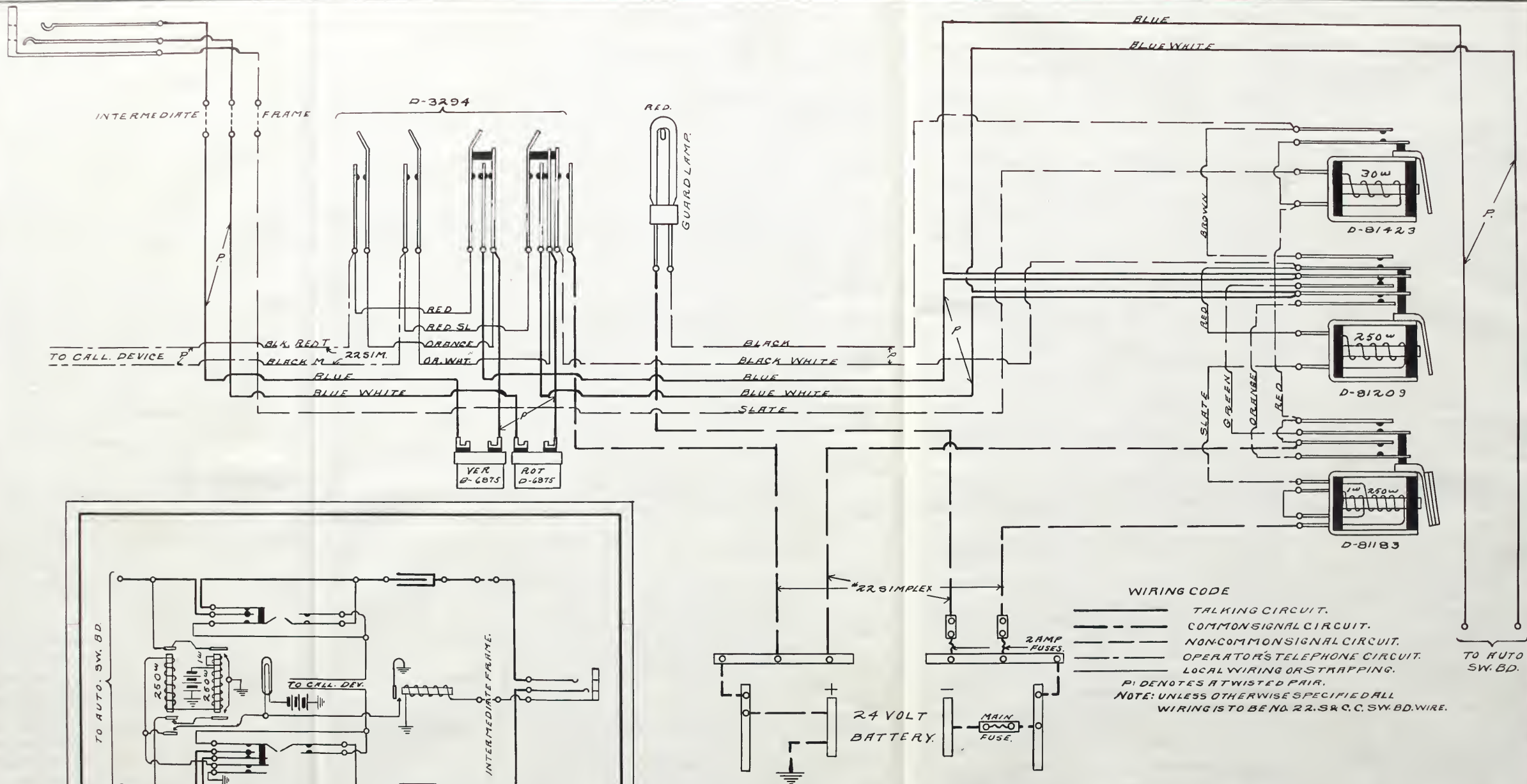
WIRING CODE.

- COMMON SIGNAL CIRCUIT.
- OPERATOR'S TELEPHONE CIRCUIT.
- LOCAL WIRING OR STRAPPING.

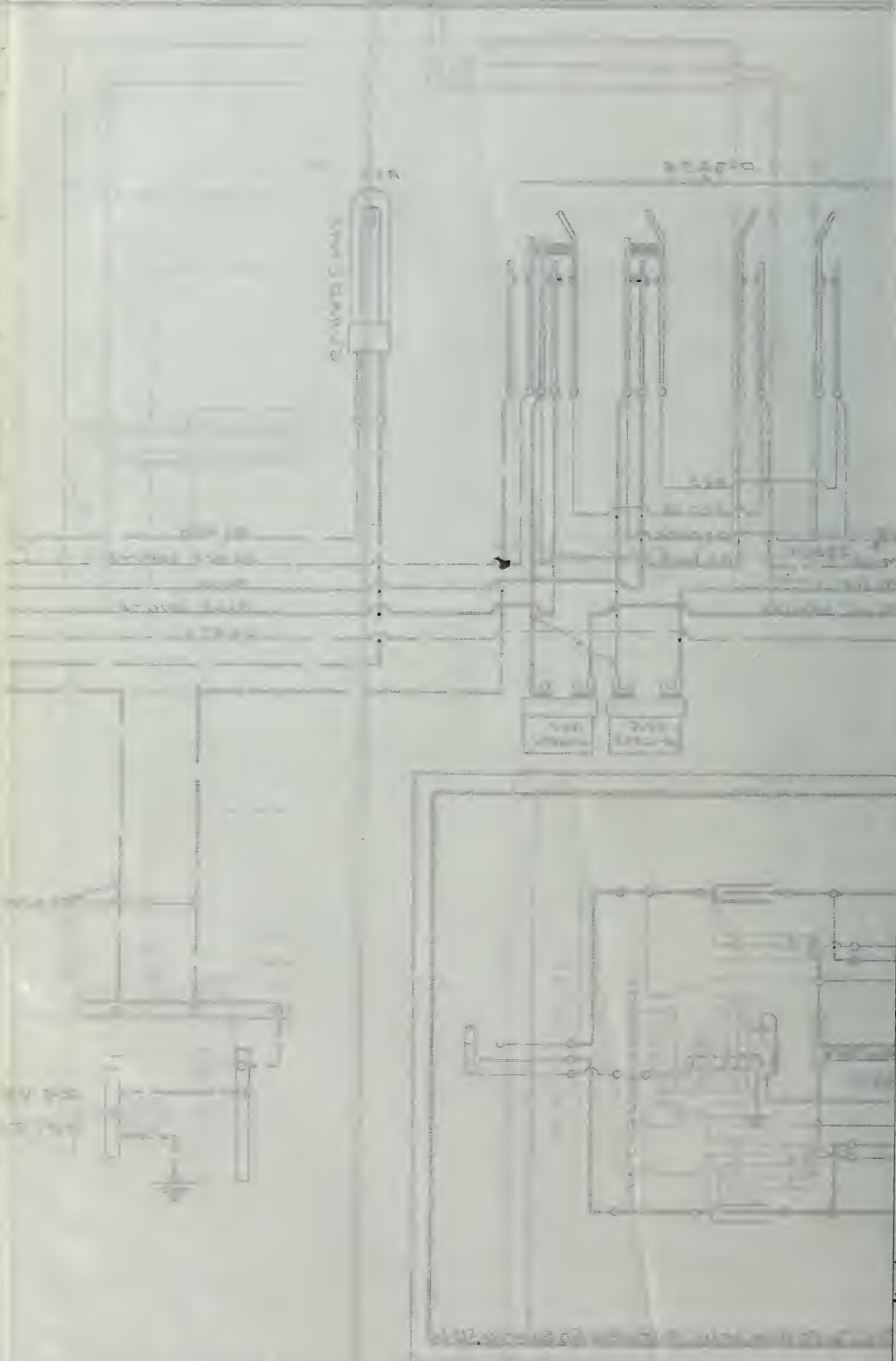
NOTE: UNLESS OTHERWISE MARKED ALL WIRING IS TO BE #22 SIMPLEX WIRE.
P: DENOTES A TWISTED PAIR.

TITLE: OPER. TEL. SET & CALLING CKT. WITH BUSY COIL & TRANS. CUT OUT KEY. NO-5071.





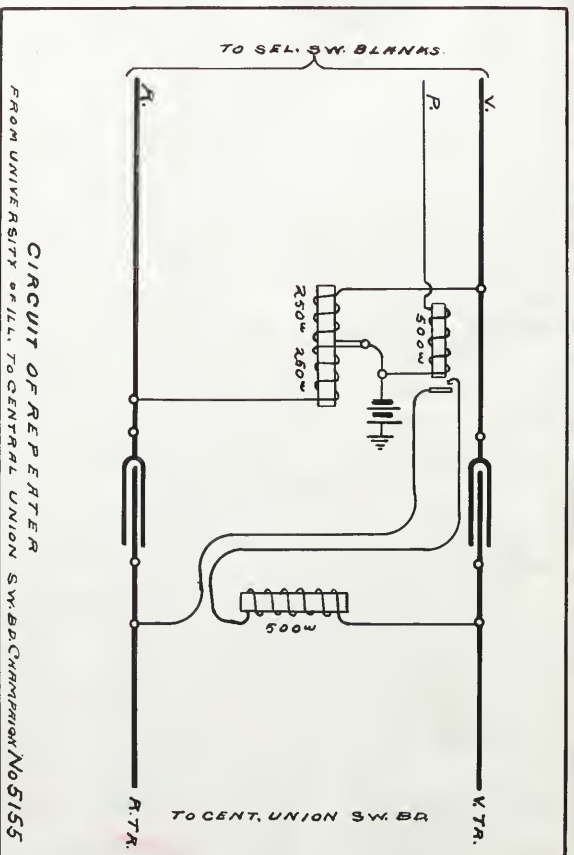
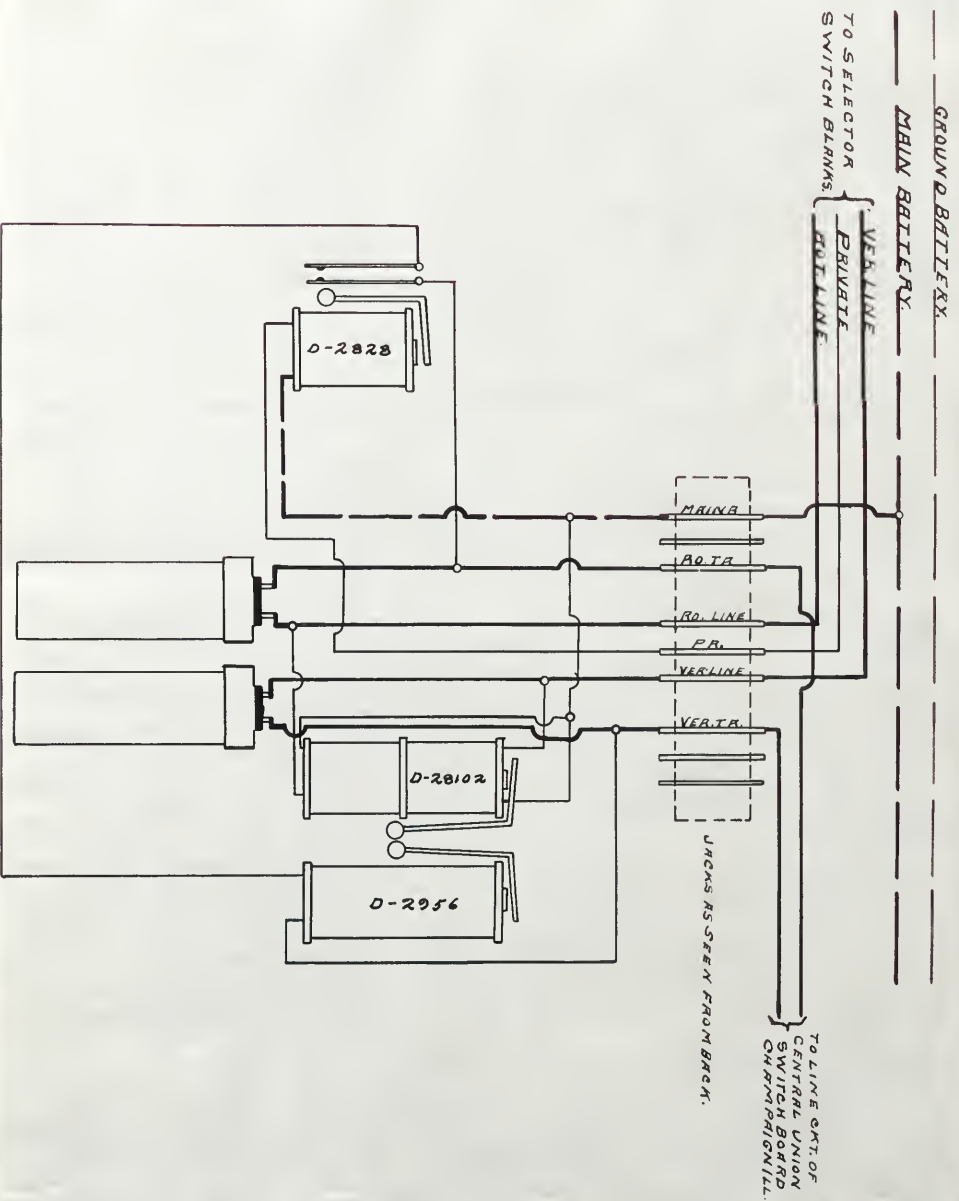
TITLE: OUT GOING TRK. CKT. FROM CHAMPAIGN
CENTRAL UNION TEL. CO. TO UNIV. OF ILL. AUTO. SW. BD.
NO 5156.



AUTO
B.D.

W.B.D.
5/56.

W.



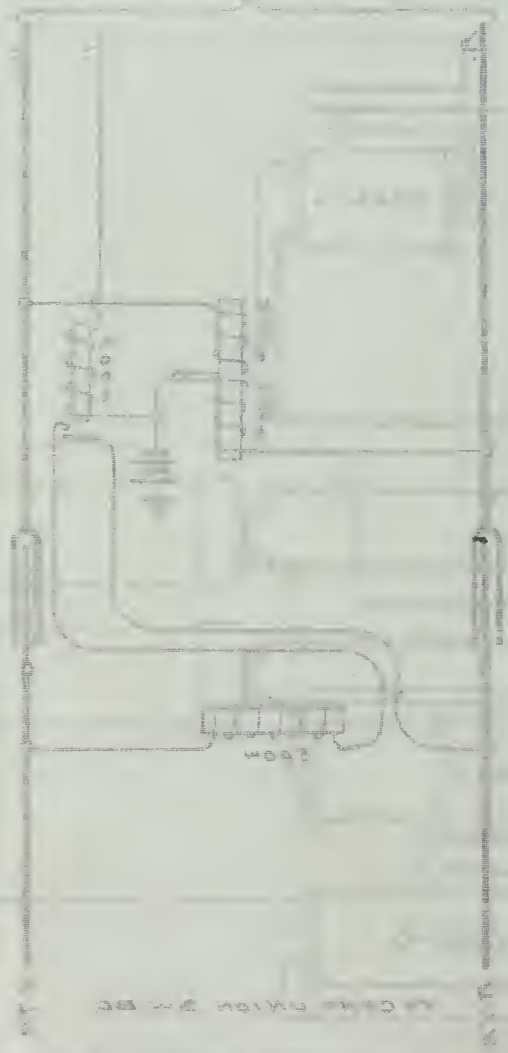
TITLE: CIRCUIT OF REPEATER FROM UNIVERSITY OF ILLINOIS TO CENTRAL UNION SW. BR. CHAMPAIGN, ILL.

GROUND BATTERY

WATER TO BE USED IN THE GROUND BATTERY

WATER TO BE USED IN THE GROUND BATTERY

WATER TO BE USED IN THE GROUND BATTERY



SPECIFICATIONS
COVERING THE
NECESSARY APPARATUS FOR THE EQUIPPING
OF
THREE OUTGOING AND TWO INCOMING TRUNKS
BETWEEN THE
AUTOMATIC EXCHANGE AT THE UNIVERSITY
AND THE
CENTRAL UNION SWITCHBOARD
OF
CHAMPAIGN, ILLINOIS.

This specification covers the necessary apparatus for the equipping of two incoming trunks, circuit 5156, from the Central Union Office to the University. The three repeaters taking care of calls from the University to the Central Union Office and made up as per circuit 5155, will not be called for in this specification but will be ordered separately under a separate sales order.

A description of the operation of both incoming and outgoing calls from the University will be described later on.

Apparatus for Two Incoming Trunks, Circuit No.5156.

- 2 D - 3294 Keys
- 2 D - 4213 Supervisory lamp jacks
- 2 D - 6777 Lamp caps
- 2 Type "M" 1.3 C.P. 24 Volt lamps
- 2 D - 81423 Relays
- 2 D - 81209 "
- 2 D - 81183 "
- 6 D - 6875 Condensers
- 1 D - 3147 Relay mounting
- 2 D - 4526 " insulators
- 1 Drawing No.3869 Calling device mounted on temporary panel.

CIRCUITS:

- 5155 Repeater
- 5156 Trunk Circuit from Central Union to the University.
- 5071 Operators Circuit.

DESCRIPTION OF CIRCUITS

Circuit No.5155 gives a diagram of the repeater which is used when a University subscriber wishes to make a call to the Central

Union Exchange, some level on the first selectors would be chosen for this use (say the fifth level).

Any subscriber on the University exchange pulling five on their dial would select one of the three idle repeaters designed as per circuit 5155. Whenever the first selector lands on one of these idle repeaters, ground battery is fed over the Private wire which passes through the 500 ohm coil to main battery (M.B.). Upon energizing this 500 ohm relay the contacts of the same are closed, thus shorting the line to the Central Union Exchange through a 500 ohm coil which signals the operator in the same manner as though any of the Manual subscribers of the Central Union Exchange had removed their receivers to make a call. The University subscribers then tell the operator the number wanted and the call is put through in the regular way. Double supervision at the manual board will be given as when the University Exchange subscriber hangs up his receiver, main battery is fed back to the selector switch on both sides of the line through the double wound 250 ohm coil mounted on the repeater; in this way the switch is released and the shunt through the 500 ohm coil is opened, thus letting the relays in the operator's cord circuit fall back to normal and thereby giving her clearing out supervision.

All the equipment shown in circuit 5156 is to be located at the Central Union Office. None of the multiple jacks in the main exchange will be made accessible to this trunking operator.

Any Central Union subscriber wishing to make a a call to the

University will do so by first removing his receiver in the regular way. The operator answers and when learning that the University is wanted cuts in an order wire to the trunking operator and gives her the number wanted. The local operator then inserts her calling plug in the non-busy multiple or the one assigned by the trunking operator over the order wire. As soon as the local operator plugs into the multiple jack a red or guard lamp lights by the energizing of the 30 ohm relay D - 81423 and remains lighted until the conversation is through.

The trunk operator upon learning the number desired, cuts in the calling device by means of the key D - 3294 and calls the University in the regular way. The releasing relays are energized when the operator plugs into the multiple by the ground from relay D - 81423 and also by the ground furnished when the key D - 3294 is thrown should the trunking operator call the University when the plug is not in the multiple.

Supervision in this case is handled by the subscribers operators and as mentioned before the guard lamp remains lighted until she pulls down the connection. The call originated by the trunking operator is released also when the subscribers operator has restored her key to normal. In this case she will note that the guard lamp is lighted and restore the key to normal, thus releasing the connection.

The release is made through the slow and fast acting relays D - 81183 being slow while D - 81209 is fast.

When ground is cut off of these relays the fast relays close two contacts, one on either side to ground through which is fed ground battery out on to the line thus releasing the connections.

Thus it can be seen that the necessary connections and operations to be performed are relatively simple even on a complicated system like the automatic, complicated in the way of connecting wires and not operations necessary to get a party.

Whether or not a state law can make such a project a success is no doubt open to much discussion, but I think it could not for two reasons: First; On account of the Corruption and graft connected with politics, the just fixing of rates and other regulations would in a majority of cases be lacking; it would be simply a case of which company had the most money as to whether or not it would be favored. The recent case of the Wisconsin Railroad Commission is a good example.

About the middle of last March a decided jolt interrupted the smooth progress of this commission in regulating the administration of public utility corporations. The people of the state learned that the secretary of the commission had accepted a fee for promoting a consolidation of the Dane County Telephone Company with the Bell company, thus not only extinguishing competition at Madison, but diminishing its effectiveness at neighboring connecting points. The people of Wisconsin, and their representatives in the legislature have been greatly disappointed by a disclosure affecting the reputation of a favorite branch of the government service.

The news came out before a committee of the legislature, during a discussion of a bill which provides that no telephone exchange shall be started in a community where there is already one in operation, unless the railroad commission shall grant a certificate of public necessity.

It has been believed, in some quarters, that the members of the commission might show a leaning toward habits of reasoning in the abstract, common among men who study business from the distance, and be less familiar with, and less impressed by the actual benefits wrought by telephone competition than those who have been close to the problems of industry. Yet no person had ever imagined that any movement would be made by the commission which would be so clearly against the interests of the people of the state as to restrain or try to prevent competition in the telephone business. Now the act of a confidential employee, holding the highest position under the commissioners, has brought about a change in conditions which is unquestionably to the disadvantage of the public, as well as of owners of Independent telephone exchanges in Wisconsin.

Much of the good work which has been done by the Wisconsin Railroad Commission is known the country over, and in Wisconsin and elsewhere is considered a great credit to the state. There is no suspicion, nor any room for suspicion, of the integrity, nor sound ethical sensibility, of the three present commissioners. But the people of Wisconsin have suddenly learned to beware of future pos-

sibilities. For the present, they will fear to give too much power to a body of men who, by their very isolation from the lower planes of life, can be so easily deceived that their own outer office may become the seat of manipulation, and the chief of their employees become, for a price - a percentage commission on the purchase price - the go-between in a transaction which has already operated to decrease the efficiency of a service, and will most certainly have the effect of raising its price, in the capital city of the State.

The price the Bell Telephone Company could be induced to pay for the Independent Company was dependent on the rates they would be allowed to charge after securing the monopoly. The rate commission has control over those rates. The secretary of that commission has received a large price and retained 5 per cent of it. Is he not morally pledged to lay no obstacle in the way of a rate sufficient to give reasonable profit on the price exacted by him? "If so, has he received a pecuniary benefit tending to influence his official action? Can the commission permit even such doubts to be cast on that high and almost judicial tribunal?"

There seems to be no tendency to accept excuses for the act of the secretary - it is considered by the people that his promotion of the transaction was due solely to self-interest - a desire for cash. The statement the secretary gave out was, that he was not acting as an officer of the Commission, but as a friend of one of the principal stock holders, he had urged other stock holders to sell their stock. The fact is that this stock holder was earnestly opposed to the sale, and only disposed of his stock after becoming

certain that the other holders would sell in any event and he considers that he suffered by the sale. Of course, this is only one example of graft but it is, no doubt, a good one for the Wisconsin Commission had a good reputation all over the country. It seems as though nearly every man in politics or in any public position has his price and if you pay it you can get him.

Second: The senators and representatives of a state are lawyers and politicians, they are not telephone experts; they know little or nothing about telephone business, they know that the telephone is something to talk through and that is about all. Therefore I think that such an important question should not be put to them to decide if they were entirely free from graft.

The following are some of the reports of the action taken on compulsory interchange of service of rival telephone companies.

A committee of the Missouri Senate, after giving careful consideration to the subject of compulsory physical connections of competing telephone companies, has decided that it would be contrary to the interests of the public, and reported unfavorably on a bill to bring it about.

The Texas Legislature turned down a similar bill on the ground that with such a statute enforce there would be no inducement to telephone companies extending their lines, because by such extensions at the expense of the progressive telephone company the non-progressing company would share the improved service.

The Legislature of the State of Tennessee turned down a simi-

lar bill on the same grounds.

These bills have all failed to pass this year.

Such a bill was also lost in the State Legislature of Arkansas several years ago and has never been tried since.

I do not believe, in all cases, those who have introduced bills for a compulsory interchange of service have had merely some private business to move them, but think that the desire to promote the public welfare has in many instances caused legislators to introduce these bills, thinking that the people were unanimous for the connection and would benefit by it. The action taken by the legislatures cited above show that the public is, undoubtedly, opposed to such a measure being enacted.

On the other hand the affirmative contend that such a system could be made a success by enacting a law similar to the one described above, that is one which provides for a free interchange of service, and the appointing of uninterested commissioners by the State Railroad Commission who shall have the power to regulate the rates for the interchange of service, also, all other rates of, and actions taken by the different telephone companies of the state.

Many of the states have commissions which regulate the telephone business and which are giving satisfaction not only to the public but also to the individual telephone companies as well. Governor Hughes of New York, on at least two occasions has strongly advocated the regulation and control of telephone and telegraph

corporations within the state through the public service commissions and such regulation will doubtless, be adopted in New York this year. Many of the other states are considering a like regulation of not only telephone and telegraph companies but all public utility corporations or companies as well.

In appointing a man for such a duty as a State Railroad Commissioner the man should not only be an experienced man with a good understanding of the business but he should also be entirely uninterested in any branch of business the Commission serves; these qualities, it seems to me, are necessary to get just regulation for all concerned.

Judging from all that has been independently said both for and against, the adoption of a compulsory interchange of service of rival telephone companies, it seems to me that the inevitable conclusion is against the adoption of such a system.

UNIVERSITY OF ILLINOIS-URBANA



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